Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Method for the detection in a given DNA sequence of **known and unknown** DNA mutations, single nucleotide polymorphisms, and insertions and deletions comprising the steps of:

a) producing replicate(s) with ~~an engineered~~ **a** polymerase of said ~~given~~ DNA sequence ~~with at lest 50% of one of the four natural DNA bases exchanged against a not natural base~~ **having at least 50% substitutions in at least one of the four DNA bases**;

b) using said ~~not natural base~~ **substitutions** to cleave the replicate(s) obtained in step a) and to produce a DNA product presenting sequence-specific fragments;

c) analyzing said sequence-specific fragments obtained in step b) by mass spectrometry to get sequence-specific fragment patterns; and

d) using the sequence-specific fragment patterns obtained in step c) to identify sequence changes relative to a reference to said ~~given~~ DNA sequence.

2. (Currently Amended) Method according to claim 1 wherein the ~~not natural base~~ **substitutions** in step a) ~~is~~ **are nucleotide equivalents** selected from the group consisting of an RNA base (ATP, GTP, CTP, or UTP), a phosphorothioate base, a phosphoroselenoate base, **and** a photochemically cleavage inducible base.

3. (Currently Amended) Method according to claim 1 wherein ~~in~~ the replicate **has** more than 70% ~~of one of the four natural DNA bases is exchanged against a not natural base~~ **substitutions in at least one of the four DNA bases**.

4. (Currently Amended) Method according to claim 1 wherein ~~in~~ the replicate **has** 100% ~~of one of the four natural DNA bases is exchanged against a not natural base~~ **substitutions in at least one of the four DNA bases**.

5. (Currently Amended) Method according to claim 2 wherein the RNA base is cleaved in step b) by treatment with alkali and incubation at ~~elevated temperature~~ **55°C**.

6. (Currently Amended) Method according to claim 2 in which the phosphorothioate or phosphoroselenoate base is cleaved in step b) by condensation of a compound ~~of the nature~~ **having the formula** OH-(CH2)n-I, where n=2-5, and incubation at ~~elevated temperature~~ **55°C**.

7. (Original) Method according to claim 2 in which a photochemically cleavage inducible base is cleaved in step b) by exposure to light.

8. (Currently Amended) Method according to claim 1 wherein the step a) of producing replicate(s) is carried out with a procedure selected from the group consisting of the polymerase chain reaction ~~OPCR)~~ **(PCR)** and the linear DNA copying procedure.

9. (Original) Method according to claim 8 wherein the linear copying procedure is a rolling circle replication.

10. (Previously Presented) Method according to claim 1 comprising further a step a') between step a) and step b), wherein in step a') the replicate(s) is/are purified.

11. (Previously Presented) Method according to claim 1 comprising further a step b') between step b) and step c), wherein in step b') the sequence-specific fragments are purified.

12. (Currently Amended) Method according to claim 1 wherein the mass spectrometer used for step c) is selected from the group ~~comprising a~~ **consisting of** MALDI and ~~an~~ ESI mass spectrometers.

13. (Currently Amended) Kit for the detection in a given DNA sequence of **known and unknown** DNA mutations, single nucleotide polymorphisms, and insertions and deletions for implementing a method according to claim 1 comprising:

~~An engineered~~ **a** DNA polymerase,

~~A~~ **a** set of ~~non-natural bases and dNTPs~~ **nucleotide equivalents selected from the group consisting of an RNA base (ATP, GTP, CTP, or UTP), a phosphorothioate base, a phosphoroselenoate base, and a photochemically cleavage inducible base, and**

~~A~~ **a** buffer.

14. (Previously Presented) Method according to claim 10, wherein the replicate(s) is/are purified on reversed phase material.

15. (Currently Amended) Method according to claim 10, wherein the replicate(s) is /are ~~purfied~~ **purified** with ion exchange resins.

16. (Previously Presented) Method according to claim 11, wherein the sequence-specific fragments are purified on reserved phase material.

17. (Previously Presented) Method according to claim 11, wherein the sequence-specific fragments are purified with ion exchange resins.